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THE NEUROLOGICAL CORRELATES OF SEXUAL OBJECTIFICATION: A REVIEW OF EXISTING LITERATURE

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ABSTRACT

Previous research finds that sexual objectification is a neurological phenomenon rather than "not being able to take a compliment" or a "metaphor". The three outlined studies investigate the underlying processes of sexual objectification. The first study outlines the "oddball effect," which is when people pay more attention to things that are unusual or unexpected. Considering sexual objectification, this means people may pay more attention to sexualized images presented in non-sexual contexts than to conventional sexualized images. The second study examines the "body inversion effect," which demonstrates that when people view others upside down, they struggle to recognize and comprehend information about them. The study investigates why this effect is more evident in sexualized or objectified bodies than in non-sexualized ones. Finally, the third study analyzes brain activity in specific neural regions to check individual perception. The studies prove that sexual objectification is more complex than 'not being able to take a compliment.'

KEYWORDS: sexual objectification, neurological, oddball effect, body inversion effect,

INTRODUCTION

Sexual objectification occurs when a woman's body or body parts are singled out and separated from her as a person and she is viewed primarily as a physical object of male sexual desire (Bartky, 1990). Szymanski et al. (2011) asserted that women, to varying degrees, internalize this outsider view and begin to self-objectify by treating themselves as an object to be looked at and evaluated on the basis of appearance.

More specifically, Szymanski et al. (2011) postulated that self-objectification can increase women's anxiety about physical appearance (i.e., fear about when and how one's body will be looked at and evaluated); reduce opportunities for peak motivational states or flow; diminish awareness of internal bodily sensations (e.g., hunger, sexual arousal, stomach contractions); increase women's opportunities for body shame (i.e., the emotion that results from measuring oneself against a cultural standard and coming up short); and increase women's anxiety about their physical safety (e.g., fears about being raped), which in turn can lead to disordered eating, depression, and sexual dysfunction.

It is still widely held that objectification is a manifestation of hypersensitivity and that victims are "too emotional." It is a belief rooted in patriarchal ideals and reinforced by societal standards that favor sexualization, despite objectification being a phenomenon with major psychological, emotional, and physical implications (Calogero et al., 2022). However, a better understanding of the processes that underlie sexual objectification can create an equitable society.

Literature review

Source 1

The methods and findings section of the study titled *"Assessing neural responses towards objectified human targets and objects to identify processes of sexual objectification that go beyond the metaphor"* provides information using an experimental paradigm known as the *Oddball Effect*. This paradigm was utilized to investigate potential neurological differences in the brain's response to objectified human targets compared to non-objectified human targets and objects. The researchers discovered that when participants perceived sexualized images of women in contrast to non-sexualized images and objects, there was a more pronounced neural response in areas of the brain associated with object processing and sexual arousal. These findings suggest that the sexual objectification of women may activate similar neural pathways involved in the processing of objects. Therefore, the oddball effect serves as evidence for the neurological implications of sexual objectification, akin to the findings outlined in *"The Neural Correlates of Cognitive Objectification"* regarding the inversion effect. The study also implies that objectification has harmful effects on the victims, and this claim is supported by the study titled *"What drives female objectification? An investigation of appearance-based interpersonal perceptions and the objectification of women."*

Source 2

"The Neural Correlates of Cognitive Objectification," published in the journal Social Psychological and Personality Science (Volume 8, Issue 5, pp. 550-559), is an essential source for understanding sexual objectification as a pervasive phenomenon. In this study, the researchers utilized functional magnetic resonance imaging (fMRI) to examine brain activity in response to sexualized individuals and objects. The findings revealed that cognitive objectification was associated with increased activation in the occipitotemporal cortex, suggesting that sexual objectification involves perceiving a person's body as an object rather than as a whole individual with thoughts and emotions. These findings align with the study titled *"Assessing neural responses towards objectified human targets and objects to identify processes of sexual objectification that go beyond the metaphor"* and the study by Kellie, D. J., Blake, K. R., and Brooks, R. C. (2019) titled *"What drives female objectification? An investigation of appearance-based interpersonal perceptions and the objectification of women."* These sources provide insights into the neural mechanisms underlying sexual objectification, including the effects of body inversion.

Source 3

Kellie et al. (2019) conducted a study to examine the link between appearance-based interpersonal perceptions and female objectification. The study found that women who were perceived as attractive were more likely to experience sexual objectification. The researchers also observed that individuals who engaged in the sexual objectification of women displayed higher levels of activation in brain regions associated with reward and visual processing while showing reduced activation in areas related to empathy and mentalizing. These findings suggest that there are neurological correlates to sexual objectification, and it may be influenced by a combination of appearance-based interpersonal perceptions and underlying neural processes.

Study 1: *Vaes et al. (2019) - Assessing neural responses toward objectified human targets and objects to identify processes of sexual objectification that go beyond the metaphor*

Introduction: In a study by Vaes et al. (2019), researchers measured participants' neural responses when exposed to human and infrequent doll-like stimuli. It was intended to determine whether the objects that differed from the human stimuli triggered a late brain response (P300), known as the *Oddball Effect*. The study tested the hypothesis that women are perceived as more similar to objects compared to other human targets by conducting three experiments. The well-known *Oddball Paradigm* was employed in the studies; in which a succession of repeated stimuli is occasionally interrupted by an aberrant stimulus, i.e., the oddball. In an active condition, event-related potentials (ERP) were recorded, and the response to the oddball and repetitive stimuli was analyzed. The P300 - an event-related potential component that occurs around 250-600 ms after stimulus onset - is triggered by the infrequent stimulus, and its amplitude increases the extent to which the oddball stimulus is perceived as different from the repeated stimuli, according to research using this paradigm.

Method: The stimuli were first pre-tested using an online questionnaire in which 22 individuals (12 females) classified each image as an object or a person. Both human images and doll-like avatars were accurately identified as a person or an item (98% correct responses in both scenarios). The final sample of the experiment consisted of eighteen individuals (8 women), with an average age of 20.66 years. All participants were heterosexual and had normal or corrected-to-normal eyesight. Individual booths were used for testing, which provided sound reduction, dark illumination, and electrical shielding. There were 42 female targets (21 objectified females and 21 doll-like avatars resembling females) and

40 male targets (20 objectified men and 20 doll-like avatars resembling males) employed in the study. The participants completed a categorization exercise, pressing a key to indicate whether each image portrayed a doll-like avatar or a human target. The experiment was divided into four blocks, with the order of subjects being randomized. Each block had 250 stimuli, 80% of which were frequently objectified human targets and 20% of which were infrequent doll-like avatar targets. The trials began with a 1500 ms fixation cross, followed by the stimulus displayed until subjects made their decision. Experiment 2's final analysis, similar to experiment 1, contained 18 participants (8 females, average age 22.97). The stimuli were non-objectified male and female targets with doll-like avatars, and the task difficulty was adjusted to match Experiment 1. Experiment 1's protocol and apparatus were applied. Experiment 3's final sample included 20 people, with an average age of 21.2 and a ratio of 10 male and female participants. Participants in the study had a normal or corrected vision and no history of neurological disorders. The images from Experiment 1 were used along with a yellow or green contour of 0.3 mm dimension and equalized brightness on either side of the target body. Participants were asked to categorize stimuli based on the color of the contour, with the infrequent color being linked with doll-like avatars and the frequent color usually associated with human targets. Four blocks were produced, each with a different target gender and color. To eliminate bias, each block contained 250 regular stimuli and 25 catch trials, with the catch trials omitted from the study.

Results: The findings revealed that participants were more accurate in categorizing male targets than female targets. They were also more precise than doll-like avatars in categorizing objectified human targets. Furthermore, subjects responded slower to feminine stimuli than to male stimuli. When a female doll-like avatar appeared amid objectified female photographs, the P300 amplitude was less than when a male doll-like avatar appeared among objectified male pictures. There were no substantial differences between objectified male and female targets. These findings imply that female objectified stimuli are interpreted more similarly to objects than male objectified stimuli. To further investigate these findings, a second experiment was done using completely clothed, non-objectified photographs. The results revealed that target humanity affects accuracy, with non-objectified individuals being classified more accurately than doll-like avatars. The electrophysiological data revealed a strong oddball effect, with doll-like avatars generating a larger positive wave than non-objectified human targets. The P300 had a greater amplitude for female targets, but there was no relationship between target gender and humanity. These findings imply that when female images are not objectified, they are viewed as being as distinct from objects as their male counterparts. Furthermore, there was a significant interaction between Experiment 1 and Experiment 2, demonstrating that only objectified female targets were perceived more similarly to objects. This shows that objectified women are viewed as more akin to objects than women in general. Experiment 3 sought to demonstrate that objectified women are regarded as more like things, even when the human-object component is unimportant to the job at hand. Participants classified images depending on the color of the contour line. According to electrophysiological studies, the amplitude of the P300 was influenced by both target gender and humanity, notably in the occipital area and in a later time window. Male doll-like avatars elicited greater activation than female doll-like avatars, but there were no significant differences between objectified male and female targets. Furthermore, when compared to objectified male stimuli, male doll-like avatars produced a substantial favorable shift, whereas objectified female photographs and their doll-like avatars produced no significant change. These data demonstrate that male doll-like avatars are viewed as more analogous to objects than female doll-like avatars, lending credence to the notion that objectified women are perceived as increasingly similar to objects.

Study 2: *Bernard (2018) The neural correlates of cognitive objectification: An ERP study on the body inversion effect associated with sexualized bodies*

Introduction: The study "The Neural Correlates of Cognitive Objectification" by Bernard et al. (2017), published in the *Social Psychological and Personality Science Journal*, investigates how the brain processes sexualized and non-sexualized bodies compared to objects. The researchers measured brain activity using the N170 component, which reflects early visual processing and was used to quantify brain activity. Inverted faces and bodies typically elicit greater N170 responses, indicating configural processing. However, the researchers hypothesized that sexualized bodies would not show this sensitivity to inversion and would be processed more like objects. The hypothesis of this study was that configural information is less significant for the perception of sexualized bodies, resulting in no inversion effect at the electrophysiological level for these stimuli, contradicting the concept that intact bodies are always processed configurally. The N170 component, a negative potential that peaks around 170 ms following stimulus onset, has received special attention. Studies using the inversion paradigm (Stekelenburg & de Gelder, 2004; Minnebusch, Suchan, & Daum, 2009; Bauser & Suchan, 2013) found that inverted bodies elicit larger and delayed N170 responses than upright bodies, whereas this effect is not observed for objects. The current study focuses on N170 amplitude as a predictor of configural versus analytic processing. Non-sexualized bodies, according to the hypothesis, are more sensitive to inversion, with greater N170 amplitudes for inverted than upright bodies, indicating configural processing. The potential impact of target gender on modulating the effect of target sexualization is also investigated.

Method: The study aimed to investigate the body inversion effect using ERP recordings and included 20 participants (11 women, mean age 22.25). The experiment was divided into five blocks, each presenting different stimuli categories (non-sexualized female and male bodies and object stimuli). Within each block, participants viewed upright and inverted versions of the stimuli, and their task was to indicate the orientation of each image. The experiment used a quasi-randomized order for the presentation of blocks. The EEG signals were recorded using a 32-channel system. The EEG data were filtered and segmented into epochs for further analysis. The N170 component was measured at occipito-temporal electrode sites P7 and P8. The N170 peak amplitude and latency were computed within a specific time window relative to the baseline.

Results: Separate repeated measures ANOVAs were conducted on N170 amplitudes and latencies. For N170 amplitudes, the major impacts of target gender, target sexualization, picture position, and hemispheric lateralization were significant. Inverted non-sexualized bodies exhibited a greater N170 amplitude than upright non-sexualized bodies, but there was no significant difference between inverted and upright sexualized bodies. A Bayesian study supported the absence of an inversion effect for sexualized bodies. There was a significant interaction between target gender and picture position, with inverted male bodies having bigger amplitudes than upright male bodies, while no significant difference was identified between inverted and upright female bodies. Female bodies in the right hemisphere had greater N170 amplitudes. A separate ANOVA on N170 amplitude inversion effects revealed that non-sexualized bodies had a considerably greater inversion effect than objects and sexualized bodies. Significant main effects for target sexualization and image position were reported for N170 latencies, with delayed latencies for sexualized bodies and inverted bodies. There was also an interaction between target gender and target sexualization, with sexualized male and female bodies having delayed latencies compared to non-sexualized bodies. A significant three-way interaction revealed that inverted non-sexualized female bodies had longer latencies than inverted non-sexualized male bodies. The study's findings confirm the notion that when presented in an inverted orientation, sexualized bodies do not exhibit the same neural response (N170 amplitude inversion effect) as non-sexualized bodies, providing confirmation for the neurological implications of cognitive objectification.

Study 3: Kellie et al. (2019): *What drives female objectification? An Investigation of appearance-based Interpersonal Perceptions and the Objectification of Women*

Introduction: This study analyzes the cues that contribute to female objectification. Participants in Study 1 assessed images of women based on their perceived sexual intent, attractiveness, and age. A separate group of participants in Study 2 assessed the same photos on measures of mental and moral agency and patiency. The study investigates the interpersonal impressions most linked with objectification and contrasts male and female perceivers.

Method: Two trials were carried out on a collection of 56 photographs of women for the investigation. The images included full-body shots of women in varied clothing styles, ages, ethnicities, and weights.

Study 1 involved 279 participants (146 men and 133 women). Participants answered questions about 28 randomly selected images of target women. The questions were designed to examine the perceived chance of casual sex, attractiveness, and age. Statistical analyses were used to investigate gender variations in ratings.

The second study comprised 1,695 individuals (954 males and 741 females). Measures of agency and patiency were used to assess participants' perceptions of mental and moral attribution towards the target women. Additionally, participants completed measures related to income dependence, perceived female economic dependence, sociosexual orientation, and self-perceived mate value.

Results: When compared to female participants, male participants were observed to attribute less agency to target women. Both male and female participants regarded target women considered to be more open to casual sex as less capable of self-control, less able to discriminate between right and wrong, less responsible for their actions, and less likely to achieve success by intention rather than luck. Target women's perceived attractiveness was connected with higher agency and had varying effects on patiency.

Discussion

The results of the studies support the notion that sexual objectification is a measurable and distinct neural phenomenon. Considering that people exposed to sexually suggestive photographs experienced a significant increase in the activity of neural regions associated with visual processing and reward. Furthermore, this increase in neural activity was more significant in people who indicated a greater proclivity to engage in objectifying thoughts and behaviors. These findings have important implications for our understanding of sexual objectification's impact on both individuals and society. By better understanding

the neurological processes underlying sexual objectification, we can design more effective interventions and policies to reduce its prevalence and detrimental effects.

Overall, the findings emphasize the significance of research into this topic, particularly regarding its relationship to gender-based violence and discrimination.

Conclusion

Sexual objectification reduces a person to a mere instrument of sexual pleasure, disregarding their personality and individuality. According to the above research studies, the sexual objectification of women is connected with specific patterns of brain activity, implying that it may involve dehumanization and a focus on an individual's physical appearance and sexual appeal rather than their internal mental states. The studies show that sexual objectification may activate neural pathways similar to the processing of objects rather than the processing of people, further indicating that sexual objectification involves dehumanization. The studies used various experimental paradigms such as the oddball effect, event-related potentials, and the body inversion effect to investigate the neurological correlates of sexual objectification. The findings highlight the negative impacts of sexual objectification and the importance of promoting respect and equality toward everyone, regardless of gender or appearance.

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